ELECTRICITY ON THE FARM *Magazine*

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1957

Portrait of a happy family that's living better electrically. There's good reason for the smiles—the most recent is an electric dishwasher. See story on page 22.

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Hydro-Cooled Corn Sells for More..... page 14
How to Select and Install an Attic Fan..... page 24

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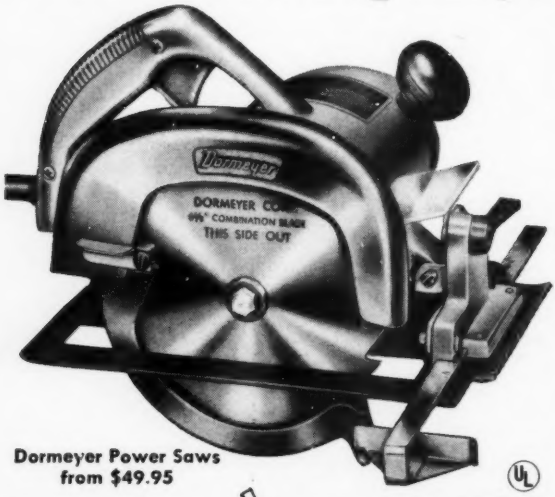

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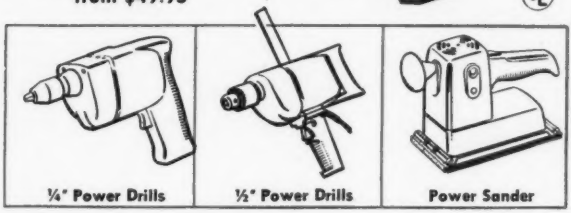

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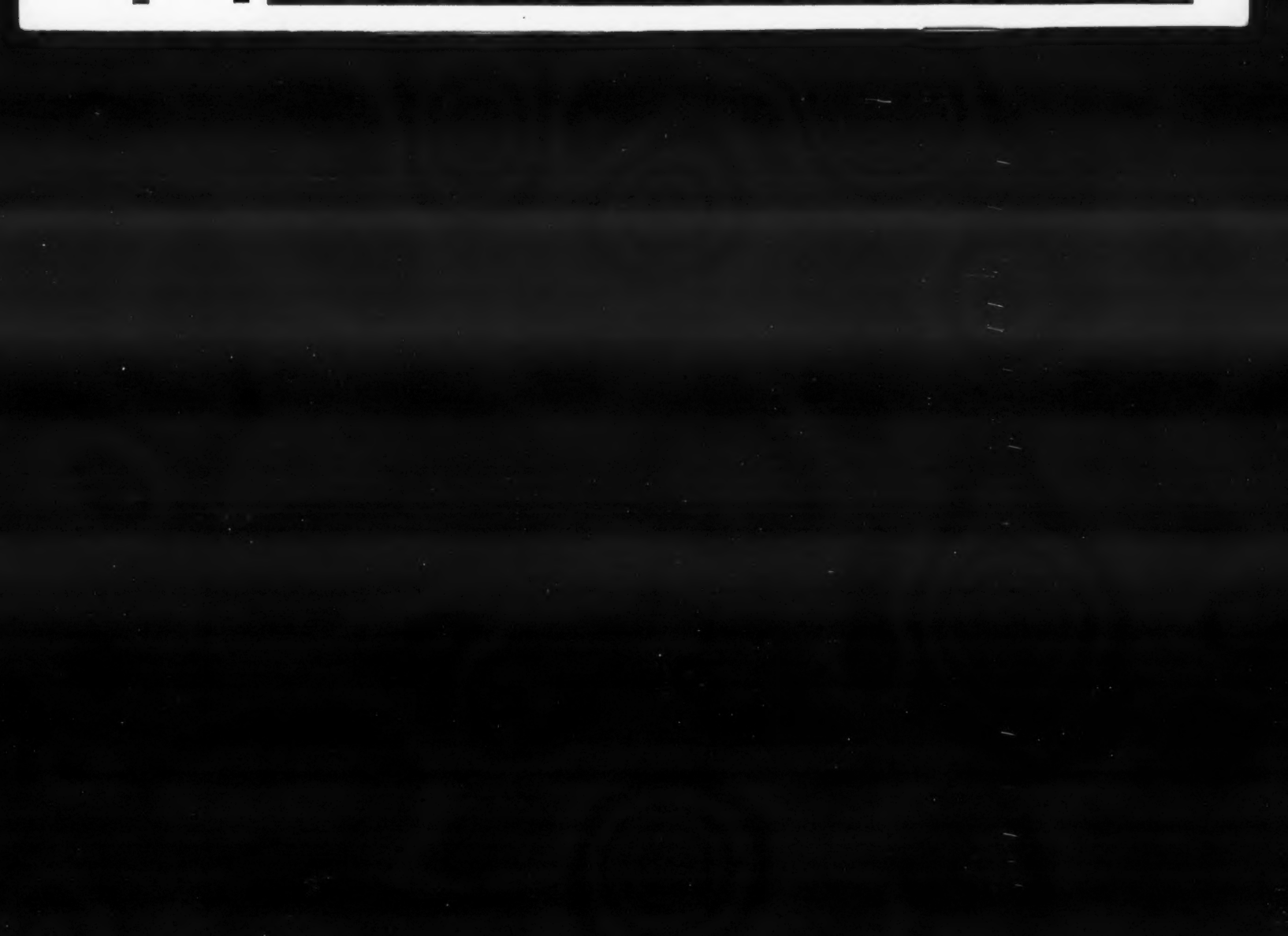
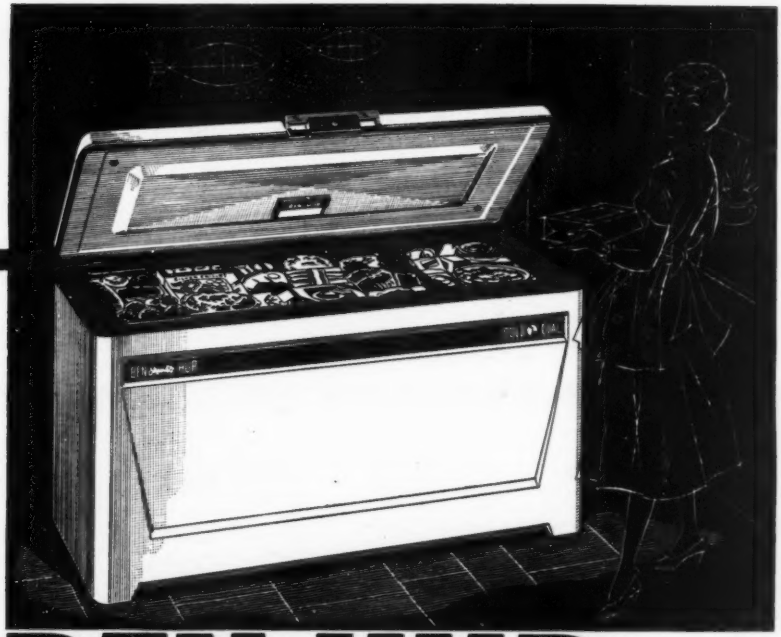


YOU'LL FIND IT EASY TO DECIDE



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Editor's Chat

ENGINEERS OF AGRICULTURE

Not too many years ago a farmer was judged by the amount of work he and his family could do from sun-up to sun-down six days a week. But today's successful farmer has an efficient and well-managed operation and the actual number of hours he works is incidental. It is scientific farming. He benefits from improved technology contributed by specialists in every phase of agriculture.

Proper management and mechanization enables him to use this technology to his advantage. They go hand in hand. One without the other is useless. But together almost anything is possible. Today's farmer can now feed 1,000 beef cattle in thirty minutes, can handle 40,000 broilers, or can grow more than 300 bushels of corn per acre.

Just think for a moment how mechanized we have become on our farms. Did you know that we have more than 18 billion dollars worth of mechanical equipment in use? We are using our share of power, too. Counting all the tractors, engines and electric motors, every farm worker has an average of 35 hp to assist him.

It is fairly certain no one would argue the fact that farm mechanization has had a tremendous impact on agriculture. Less than 13 percent of our population produces all farm products today compared to 85 percent one hundred years ago.

Whether it is handling materials, processing products, or controlling environment, we have mechanical equipment to do it. True, we haven't licked all the problems. And it wouldn't surprise me if we don't always have some that are unsolved. Regardless, we are blessed with being farmers in a most progressive age—the age of mechanized agriculture. We have accepted the machine to do most farm jobs. Engineers, and especially Agricultural Engineers along with imaginative and ingenious rural men and women deserve much of the credit for this engineering miracle.

This year marks the Golden Anniversary of Agricultural Engineering. Back in 1907, they organized their professional organization—the American Society of Agricultural Engineers. Today almost 5,000 Engineers of Agriculture are members. We take this opportunity to salute ASAE and its members for their many contributions to agricultural advancement during the past 50 years. Their primary objectives have and will continue to include: greater production per farm worker; fewer man-hours per unit of produce; a greater return to the farmer; and improved quality at lower cost for the consumer. The achievement of these goals involves a combination of many factors including research, education and extension. Other operations of equal importance include design, development, testing, production, application, sales engineering, maintenance and management.

As ASAE members conclude their first 50 years with the annual meeting at Michigan State University June 23-26 they will also be laying long range plans for the engineered agriculture of tomorrow. There is no limit to the progress that the Agricultural Engineer and the farmer can make together.

OUR 30th ANNIVERSARY

Like the Agricultural Engineers, we too have reached a milestone this month with our 334th issue since June 1927 without interruption. These issues are a permanent record of the progress made in the application of electricity to farming. In leafing through the pages of these issues it was also clearly revealed that this progress was equally shared by the electrical equipment manufacturers, power suppliers, agricultural engineering researchers, teachers and extension workers, and farmers alike. We are deeply grateful for their respective contributions in order that we could bring to you the latest information for applying electricity on your farm.

Jim Ridout

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ELECTRICITY ON THE FARM *Magazine*

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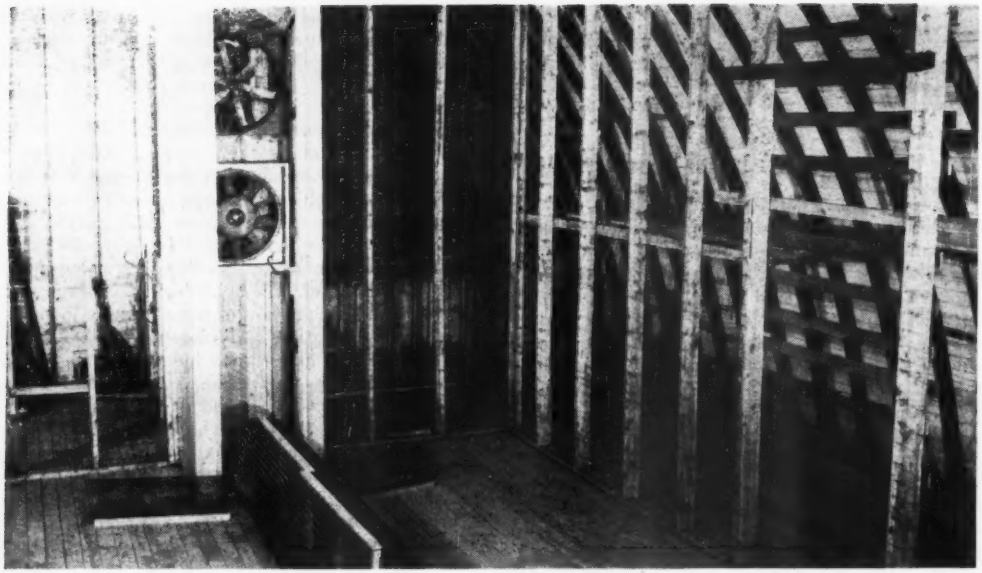


VERTICAL AIR CHAMBER with bottom circular duct in position. Air chamber opening above duct will be closed before hay is put on system. Two fans deliver 25,500 cubic feet of air per minute. Plywood door covers top fan during single fan operation.

Tiered Duct Hay Drying

Researchers develop method to improve air distribution and control in upper levels of high, narrow mows

By **W. L. KJELGAARD** and **P. M. ANDERSON***

Leafiness and green color are generally recognized as the most important characteristics of quality hay. In alfalfa, approximately 70% of the protein and 90% of the carotene are in the leaves. The time of cutting and methods of harvesting determine to a large degree how much of this quality is retained. Cutting at the proper stage of maturity is the first very important step. Then there is the risk of rain before it is dry. When hay is field-cured, a large percentage of leaves are lost due to shattering.

To reduce these losses, it is advisable to store hay at 40-45% moisture (tough enough to resist leaf shattering) and complete the drying process in the mow. Mow drying also reduces the chances of weather damage.

All hay storage facilities are not the same. Therefore, one type of hay drying system will not perform equally well in all installations. A prevalent problem is that of obtaining adequate and uniform air distribution in the upper levels of the mow from a duct system and fan installed at the floor level. This is especially true in high narrow mows where hay depths often exceed 16 feet.

For floor level duct systems, the depth of hay above the duct is an important consideration from the standpoint of both quality and economy. This depth should not exceed the thickness of hay at the side of the duct. Many air flow measurements at the top surface of actual drying installations have proven that once this recommendation of hay depth is exceeded, the air flow at the top is very slow, resulting in prolonged and poor drying.

Tiered Air Ducts

In cases where the recommended depth is to be exceeded, alterations must be made in the duct system to provide air flow to the upper level. A successful method developed at The Penn-

* Mr. Kjelgaard and Mr. Anderson are Assistant Professor and Instructor, respectively, Agricultural Engineering Department, Pennsylvania State University.

sylvania State University was to place other ducts in a tiered manner on the hay at various heights above the floor.

Different methods can be used to introduce air into the tiered ducts. If loading occurs over a long period of time a single fan may be used and hoisted to the higher ducts as the drying progresses. If the filling process is more rapid, an individual fan can be used with each duct. Or a vertical air chamber the height of the mow can be constructed and the ducts connected to this air chamber at desired heights.

One of the inherent limitations of the tiered duct system is that the mow loading must be halted while the hay is being leveled and a duct placed in position. This problem is minimized, however, by using a distributing device that loads the hay uniformly and a duct system that is light weight and easily assembled.

Research Findings

Two years of experimental work with chopped hay using tiered ducts in a high narrow (20 ft. by 40 ft. and 17 ft. high) mow have been completed. Field practices remained about the same for both years, except that some hay was crushed during the second year. When the hay moisture content was estimated to be 45 percent, field chopping was started. In clear weather, hay was cut during the morning, raked after lunch and field chopped starting about 2:30. Hay that was cut in the afternoon or evening was raked after the dew was off on the following day and field chopping was started about noon.

Several important factors and practices worthy of recommendation have been brought to light by this research:

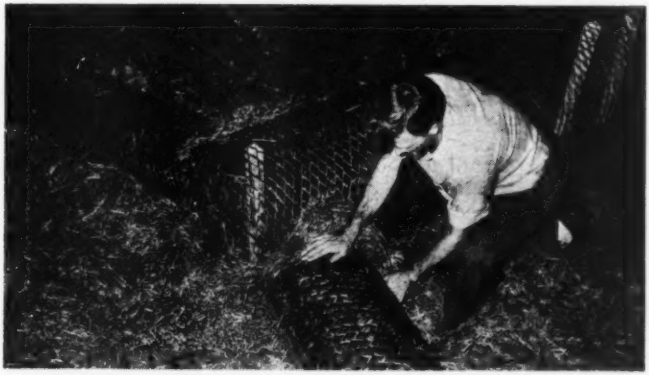
Vertical Plenum Chamber works best to channel air from fixed position fans to tiered ducts at various heights. This air chamber is 4 feet square and 16 feet high. It has a 30-inch unrestricted opening from top to bottom on the side facing the hay. This opening is closed by canvas or plywood during filling to keep hay out of the chamber.

CIRCULAR EXPANDED METAL DUCT is reinforced with 2 inch by 2 inch wooden struts. Canvas cover will be rolled upward when next duct is installed.

Circular Expanded Metal Ducts are used for the duct system to reduce time and labor of duct installation. Standard expanded carbon steel 1½" No. 10 is used, making sure that the long dimension of the expanded diamond parallels the circumference. Three individual ducts were placed lengthwise in the mow in a tiered arrangement. Each was 30 feet long, 12 feet being 30 inches in diameter and 18 feet being 22 inches.

Lateral Ducts to Mow Corners running out from the main duct improves air circulation and speeds up drying in these areas. These ducts were 14 inches in diameter and 4 feet long.

Air Flow Control is simple and easy when vertical plenum chamber is used. It offers the flexibility of increasing or decreasing air supply by using one or two fans. Air can be diverted to bottom, middle, or top of mow by opening and closing ducts as needed. Such control permits adapting the drying system to a loading schedule of either first or second cutting hay and to hay depths which greatly exceed side thickness. It also makes possible more accurate control of air through layer of fresh hay placed on top of cured hay or to areas of mow where heat may be developing.



LATERAL DUCTS are extended to mow corners to assure even drying throughout all hay in the corner areas.

On the whole, the performance of the drying system was quite satisfactory. The flexibility of this system brought about by being able to open and close ducts and to increase or decrease the air supply by using one or two fans was an outstanding feature of this tiered duct design.

Although this experimental procedure was carried out using chopped hay the result should be adaptable to both long and baled hay. The same basic principles apply to all. □ □

SPRINKLER IRRIGATION system enabled Benny Leonard to raise 23 bushels of soybeans per acre after wheat was harvested. The tall risers are also used for corn.

Don't play guessing games with the weather . . . . .

Use Sprinkler Irrigation

By E. J. GILDEHAUS

To be able to control soil moisture at will has long been the dream of many Midwestern farmers. The removal of excess moisture has never been a great problem but to be able to add moisture to a dry soil is another matter and has been thought impractical for most field crops. For the past five years, however, dry growing seasons have caused many to consider the matter more thoroughly and to even venture large capital investments to prove the value of irrigation.

As a result, the ability to add moisture to a dry soil has become a reality to many who operate just average farms. Among these folks are three Missouri farmers who have easy access to good water just about 100 feet below the surface. They are not only proud of their pumping equipment but are also happy with their investments and their crop yields.

Benny Leonhard of Portage de Sioux, Missouri installed an electric pump capable of producing 600 gallons of water per minute. With the aid of lightweight portable pipe and overhead sprinklers he figured he could outwit any weatherman on the moisture problem. He planted 30 acres of corn on May 7 and, because of a little early rain, did not apply water until

CONTROL SWITCH PANEL for Leonard's irrigation pump. Red signal lights indicate when pump is operating and can be seen from residence.

the middle of July when two inches were applied. The corn yielded 111 bushels per acre

On another field, a 45 bushel-per-acre wheat crop was harvested on July 1, and was immediately reseeded to soybeans. To this field, two inches of water was applied on August 1, and another three inches was applied on August 20. The beans were harvested October 20, with a yield of 23 bushels per acre.

Leonhard put three inches of water on seven acres of alfalfa after the third cutting. One part of the field had six inches applied. Where the amount of water was doubled, the yield of hay was also doubled. He was able to get a good stand of fall pasture by irrigating before the land was plowed and seeded.

Johnny Simon, also of Portage de Sioux, reporting on the results of irrigation on his father's farm, found that irrigation pays off in no small way. His turbine pump put nine inches of water on 40 acres of corn in three applications and produced 92 bushels per acre. Like Leonhard, Simon was limited in his per acre yield by a low stalk count—around 11,000. His neighbors who did not irrigate were happy with 50 to 60-bushel yields.

The Simons also irrigated two soybean fields. One received five inches of water by overhead sprinklers, and the other was flood irrigated by removing the plugs at the pipe joints and allowing the water to run out over the ground. The fields averaged 38 bushels per acre. One corner of one field received no water and yielded only 21 bushels per acre.

Simon also reported that eight acres of alfalfa were irrigated after the second cutting and then 24 head of cattle were turned in on the alfalfa and two acres of sudan grass. They remained on the pasture until the middle of October. Therefore, a longer grazing period is possible with irrigation.

With more and more such experiences being reported by midwestern farmers, there is little doubt that irrigation is here to stay. The big problem with most farmers is an adequate water supply. If water is available, the pumping costs are very reasonable when electric power is used. In the case of both Leonhard and Simon, the electric power costs amounted to about 30 KWHr per acre-inch of water applied.

So the pattern of irrigation in the cornbelt is taking shape. Each year sees a few more stock farmers convinced of the value of grain and pasture irrigation. In Missouri, where the distribution of rainfall makes raising corn an annual guessing game, the farmers themselves are proving its value. □ □

Low Cost Feed Handling

Conveyors and gravity, when properly utilized together, make a combination that is hard to beat for efficient materials handling. With a little planning and imagination, they can do most of the hard labor involved.

George Von Glahn, a poultryman from Escalon, California, has a well designed and economical system for handling his feed storage and preparation operations. His 24 ft. by 30 ft. two story building has storage for 85 tons of grain and three tons of ground feed on second floor. The ground floor houses feed preparation equipment and machinery.

CONVEYORS AND GRAVITY are used to move material to and away from grinding center. Leg elevator in foreground lifts grain to overhead storage bin; incline pipe feeds hammer mill by gravity.

As grain is trucked from the field it is dumped into a floor pit and elevated to second floor by a 5 hp vertical cup elevator. Here it is distributed to any one of eight large bins by a gravity flow pipe. When feed grinding time arrives, grain is piped from these storage bins to the 3 hp hammer mill on ground floor. This unit grinds it and blows it up to a temporary storage bin.

When mixing time arrives, gravity is again put to work. It lets the temporarily stored ground feed flow through a bottom opening bin chute into the hopper scale. After weighing, gravity helps empty scale hopper into 5 hp mixer where other concentrates are added.

Von Glahn's planning has taken the back-breaking work out of another handling chore.

F. Leland Elam

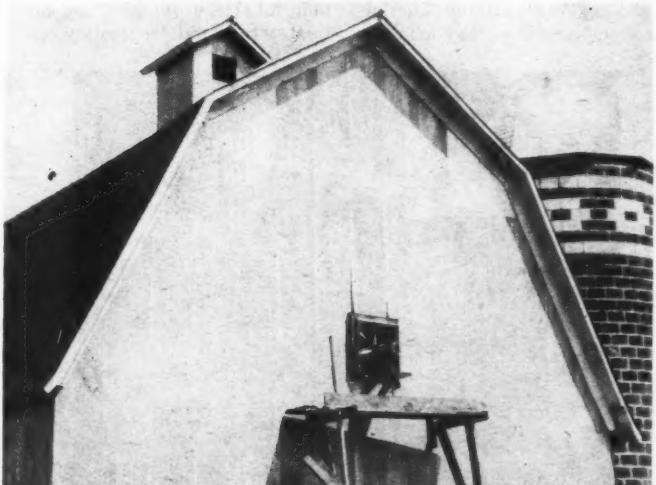
LATERAL AIR DISTRIBUTION DUCTS are easily removed. Ducts are made from dimension lumber with open screened undersides. The main duct has a two foot square cross section. Lateral ducts are 8 inches high and 10 inches wide.

Prepare Now For Wet Harvest Days

Standby drying equipment will eliminate some of the gamble in small grain storage

By **DUANE FOSSUM**

It isn't often you will find an occasion to invest in an installation which you hope you will never be required to use! That's how Milton Hunter of Gilby, North Dakota, feels about his natural-air grain drier, however. The drier was installed to handle small grain—particularly barley and wheat—which would be combined when having a moisture content too high for safe storage. Hunter farms in the productive Red River Valley of the North, about 60 miles from the Canadian border. This is not an area noted for its excessive rainfall. But it has the same problem as any other farming region, rain clouds have no respect for the harvest season!



DRYING BIN holding 1100 bushels is located in converted barn. Natural air drying is accomplished with a 3 hp propeller fan.

The general practice in the Valley is to swath the small grains and then pick up the swathed grain with a combine. This places it in a situation where a rainy harvest season could cause considerable losses in grade if the farmer must wait for the swathed grain to field dry. Also, early morning and evening combining are generally impossible due to the dampness of the grain from the night air. In both of these situations the combine could knock out the grain before it field dried to a safe storage moisture content and thus speed up the harvest if the grain could be bin dried. With a method of bin drying available, straight combining could be considered in many instances. Hunter's decision to build a grain drier was based on all of the above considerations.

Provided 3cfm per Bushel

Hunter selected a 24 inch, six blade propeller fan which is powered by a 3 hp electric motor. The required capacity of the fan was determined by allowing 3 cubic feet of air per minute per bushel of grain being dried. Consideration was given to selecting a fan capable of forcing air against a static pressure such as will develop when pushing air through a six or eight foot layer of grain.

He chose an air distribution system which consists of a main air duct down the center of the bin. It has laterals resembling inverted troughs running out through the grain. All the ducts are constructed of wood and built right on the farm.

Bin Capacity 1200 Bushels

The drying bin measures 12 ft. by 16 ft. and has a capacity of about 1200 bushels. In actual practice, however, there is generally a smaller quantity of grain in the bin which means faster drying than if the bin was filled. In the event of an extremely wet harvest period, Hunter can fill the bin to an eight foot depth and still rest assured that he will have a good quality dry grain.

Hunter's grain drying installation is housed in an old livestock barn. He cut off the bottom six feet and placed the building on a new foundation. At one end of the barn he built three storage bins with the drying bin mounted above. Actually, it is right up in the rafters. A vertical auger conveyor elevates the grain up into the cupola where the distribution pipe is located. Approximately two-thirds of the structure is used as a machine shed. The only investment he has, therefore, is the propeller fan and a small amount of lumber for construction of the duct system.

Often there is concern that the drying will be slow in the event of damp weather. Hunter's opinion is that it is better to have the grain in a bin than out in swaths in case of bad weather. And, he knows that eventually he will get his grain dried, even if a long rainy spell sets in. The movement of air will always keep the grain from spoiling.

Wet Weather no Problem With Drier

Don Molenaar, Hunter's neighbor who also farms near Gilby, N. Dak., had this to say about natural air grain drying after installing a 3 hp, 600 bushel grain drier early in the fall of 1956:

"We are glad we installed the drying bin, particularly when considering the wet harvest season we experienced. Besides the usual dangers of wet weather, it appears more straight combining is developing each year which makes a grain drier much more important. It permits straight combining in many instances where it probably couldn't otherwise be considered."

Don Molenaar had experiences which could be considered extremes in natural air grain drying. One 300-bushel batch of wheat was dried from 22% moisture to 12% in seven hours. The conditions were perfect, according to Molenaar. The day had a low humidity and an 80° temperature. Another experience during the wet harvest season was that they held wet grain for two weeks without heating. By intermittent operation of the fan, he kept the grain cool until the weather finally cleared and drying was possible. □ □

SIX-INCH VERTICAL AUGER CONVEYOR, powered by 5 hp motor, is used to elevate grain 34 feet to distribution cupola on barn roof.

Handless Egg Gathering

From hen to packing case without steps now a reality

By J. H. BODWELL

Archie Coll of East Jaffrey, N. H. is noted in his area for the vast number of chore jobs he is able to perform electrically. One of the most novel of these is his automatic egg collector. It brings eggs directly from cage nests and sends them through a grader with no manual handling.

Coll developed the collector himself over a period of about six years. Today he has a finished model that is a marvel to observe. It takes care of eggs from 9000 layers on three floors of his poultry house.

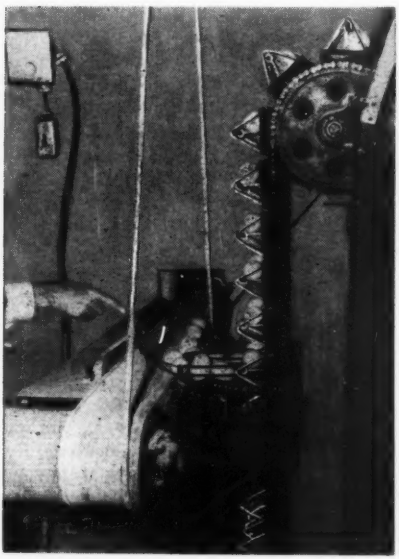
Rubber Delivery Belt Used

Sloped bottom wire nests are used. A double row of nests on each floor are set back-to-back with space between them for a six inch width three ply rubber belt. Rubber is used because canvas belting stretches too much. Each nest has an opening in the rear which allows the egg to roll down onto the delivery belt. Nests are staggered so as not to have openings opposite each other.

Delivery belts carry eggs to the end of the building. Here they are mechanically transferred to a continuously moving elevator conveyor which has a set of wire fingers to hold each egg. This conveyor carries the eggs vertically to the third floor, horizontally for a distance of 20 feet, then vertically downward to second floor. On the second floor the elevator conveyor deposits the eggs onto the egg grader. All eggs are separated into five different grades before a human hand has touched any of them. The graded eggs are removed from the grader by hand and placed in cases for cooling and storage.

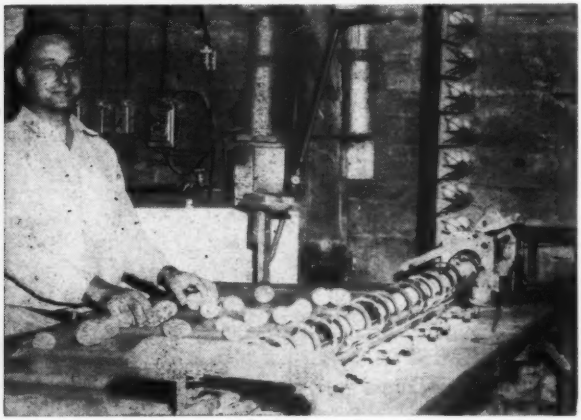
Coll, who is a very good bookkeeper, has found that the gathering mechanism has reduced this chore to just one-half the amount of time it formerly required. He also finds that he now has fewer cracked or dirty eggs because as soon as the egg is laid it rolls free of the nest. This eliminates chance for the hen to peck at it, crush it, or soil it.

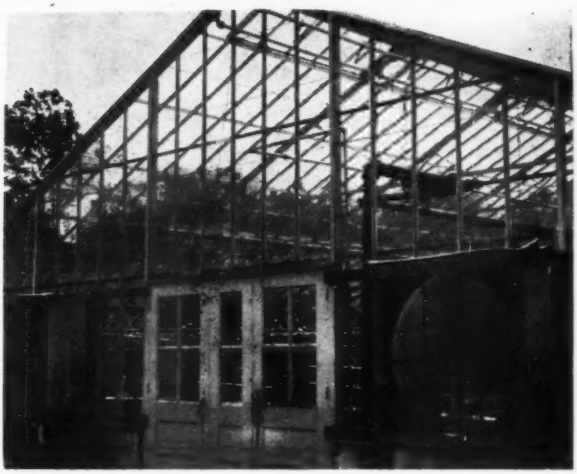
Coll says it takes about a week or ten days to train new pullets to use the cage nests. This is done by covering the bottom with shavings until they become accustomed to the nest. Then the litter is removed and it is "automatic collection" from then on. The egg gathering development, coupled with automatic watering and feeding, has enabled one man, Mr. Coll, to do the entire job of caring for 9000 laying birds. He says "without electricity this is impossible." □ □



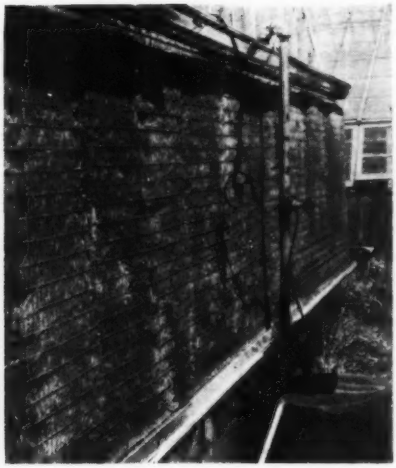
◀ **BELT BRINGS EGGS** from laying pen and deposits them onto fingered elevator to be carried to grader.

▼ **ELEVATOR FEEDS EGGS** into grader where they are separated into five lots according to size.





TWO 42-INCH FANS pull air through moist pads in W. E. Simon's greenhouse. The thermometer registers a cool 82° inside temperature for his summer carnation crop.



EVAPORATIVE COOLER is installed on rear wall. A ¼ hp motor pumps water into top trough to filter through the fibre into bottom trough.

Cooler greenhouses grow

Bigger and Better Flowers

By **RUSSELL GINGLES**

William E. Simon, veteran Chester Valley, Pennsylvania, florist, had watched his best summer carnations selling for fro.n 3 to 4 cents below out-of-state flowers for much too long. The reason for the price differential was simple. The "imported" blooms were more attractive. And, they got that way because they were grown in cooler greenhouses.

The problem, of course, was to cool off Chester Valley's hot greenhouses in a way that carnations could be produced in them economically enough to compete with flowers coming onto the market from other areas. Most florists had given up trying to compete.

But Mr. Simon was unwilling to do this. He launched his own one-man "competitive carnation" campaign and results are proving satisfactory. Electricity, the application of agricultural engineering know-how as practiced in the surrounding farming area, and two days of hard work did the trick.

Here's what Simon did to lick the problem. He installed two 42-inch, ½ hp exhaust fans, each delivering 12,000 CFM of air at one end of the greenhouse. Next, he installed a commercially-built evaporative cooler along the entire outside rear wall of the greenhouse. This cooler consists of a large frame filled with a special aspen wood fibre. Water at a rate of 14 gallons per minute, is pumped into the top trough to filter down through the fibre into the bottom trough for recirculation by a ¼ hp circulating pump.

The pump is temporarily located on the top of a barrel at one end of the cooler frame. Plans are to replace this arrangement with a permanent tank later. The barrel is kept partially filled with water from a tap-off on the greenhouse irrigation line. A float valve controls the depth of the water.

The huge evaporative cooler and the two exhaust fans work wonders in the greenhouse even when a broiling sun sends temperatures into the upper 90's. A check on the thermostatically-controlled installation showed that the inside temperature in the hottest corner of the greenhouse was no higher than 82 degrees.

Simon's controlled-environment, 3500-plant, greenhouse is kept satisfactorily cool for about two cents per hour with the system he has devised and installed. This cost is more than offset by the higher price now received for—and we might add cheerfully paid by his customers—the better quality flowers he is raising. □ □

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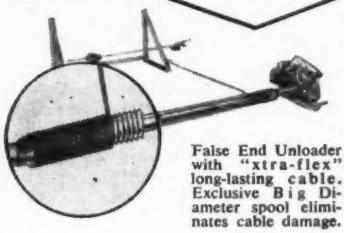

False End Unloader with "xtra-flex" long-lasting cable. Exclusive Big Diameter spool eliminates cable damage.

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ACORN BARN EQUIPMENT—STEVENS POINT, WIS.

CONCRETE COOLING TANK removes heat from corn as it is brought from field. A conveyor elevator takes corn from tank to grading table where it is boxed and immediately trucked to market.

Hydro-Cooled Corn Sells for More

Tank with refrigerated water preserves freshness

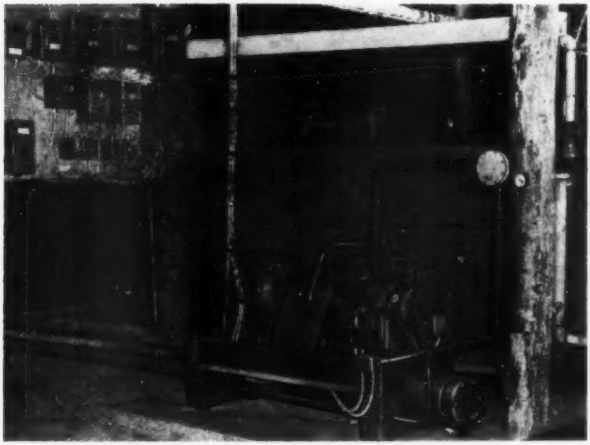
By **GEORGE O. MULLAN**

James A. Stump and son of Romney, West Virginia, have been commercial growers of sweet corn for 29 years. The last 20 of these years Stump has shipped by truck to the city markets. He grows over 100 acres of high quality sweet corn each year but in hot weather has had considerable difficulty in getting the corn on the market in top condition. Stump took all precautions possible by packing the corn in crates which had cracked ice both in and around the crate. He still had corn below top condition on arrival in markets.

In the fall of 1954, Stump saw a picture and a report of a cooler used by another farmer to remove the field heat from crops. This gave him and his partner-son, James A., Jr., the idea for a cooler of their own.

Father and son, together with Mrs. Stump, planned what they would need in the way of physical facilities to do the job and laid out the cooling tank accordingly. The average day's harvest was 1500 dozen ears—a full truckload of 300 five-dozen crates. As the truck had to leave for market at a certain hour to arrive in time to have the corn distributed to the food chain retail stores for that day's sales, it became necessary to have ample capacity to cool and pack the corn on schedule.

They decided a concrete cooling tank capable of holding 300 to 350 dozen ears at one loading was the size needed. This called for a tank 40 ft. long, 4 ft. wide and 2½ ft. deep. This tank was built with the top edge level with the top of the ground and so arranged that the corn could be dumped into the tank from the dump truck hauling



WATER-COOLED 10 hp compressor chills water used in holding tank. All of the controls for the entire operation are located on the centralized control panel.

the corn from the field pickers. At the other end of the tank an elevator was installed.

After deciding on the mechanics of the hydro-cooler, a refrigeration firm was called in and asked to design the cooling system to be used on a basis of 1½ ton per hour production. The firm recommended an ice-bank type of cooling where the water would be taken from the tank at the elevator end, strained, recooled by pumping over the ice on the refrigeration coils of the ice-bank machine and then back into the upper end of the concrete corn-cooling tank.

The problem of cooling the corn from an estimated average of 90° to below 45° called for a 10 hp, water-cooled compressor. The Stumps thought they might want to increase their capacity so they are installing a second unit. The cooling period is ½ hour, more or less, depending on heat of the corn. The amount of water needed to cool the compressor and keep the water at a constant level made it necessary to drill a well and to use a 3 hp motor on the pump which pumps 9000 gallons an hour for both purposes.

The Stumps sold all the sweet corn they produced at higher than commission prices and are well pleased with their setup. They feel it is a good financial investment. One good feature is the bright clean shuck on the corn after leaving the cooling vat. The acceptance of the cool and clean corn was so good they plan to grow 130 acres this year. They like their hydro-cooler. □ □

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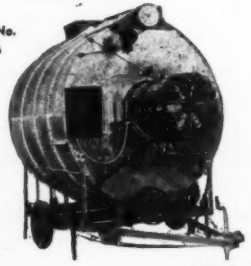
- ✓ **SAFETY**—New unmatched standards controlling pilot and power failure, excessive heat, low gas supply. Has automatic ignition. Burns low-pressure LP gas vapor with **BTU capacities up to 10,000,000** per hour.

Model No. 2408A



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Crystal Lake, Illinois

Please send me details on your new American Automatic Grain Dryer.

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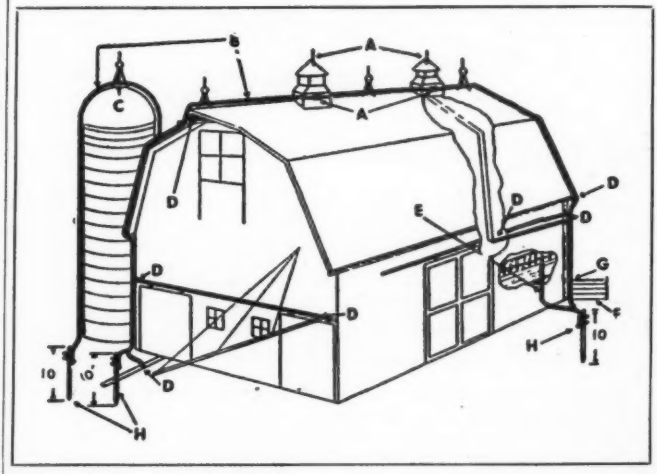
From the Ground Up

By **KENNETH V. FISKE***

As a storm approaches your farm, there is as much activity in the ground below as in the vast sky above it. Many millions of negative charges are trying to find a path to reach the positively charged atmosphere. In this struggle tremendous pressure is created. These charges, under pressure, search out an escape route which will lead them to the highest elevation, preferably following a metal path, but otherwise utilizing light poles, chimneys, or farm buildings composed of non-conductive materials. When a portion of these negative charges which are under pressure escape into the sky, bridging the atmospheric gap, there is a release of tremendous electrical force. All of this takes place in a fraction of a second.

It is not enough just to have your lightning rods well grounded. In order to complete the system, all metal parts of farm buildings should be linked together. Why inter-connect all of these metal masses? Because each and every one of them becomes charged. Unless these charges are brought to the same potential as the lightning protection system, a side flash can and does occur. Frequently it damages or destroys the so-called protected building. This inter-connection of metal buildings with the lightning rod system serves the dual purpose of collecting static electricity and then leaking this to the sky, a little at a time. This static electricity has been built up more intensively through increased

*Mr. Fiske is Agricultural Engineer, Farm Division of the National Safety Council.



LIGHTNING PROTECTION SYSTEM should be interconnected. Here, (A) each ventilator is equipped with a lightning rod connected to conductor at ventilator base. (B) Conductor lines are not run down roof valleys. (C) Silo has a separate point connected to main down conductor. (D) Roofs, hay tracks, rain gutters, vent pipes and water systems are interconnected to conductor cable. (E) and (F) Stanchions, wire fences, and other metal building parts are interconnected to conductor cable. (G) Main conductor lines should be protected against damage by livestock. (H) Drive ground conductors at least 10 feet into ground, two feet from building.

use of electrical appliances, electric water systems and increased use of metal in farm buildings.

Ground All Metal Parts

Items which should be grounded include exterior parts of buildings such as metal roofs, gutters, downspouts and drainpipes; on the inside, metal stanchions, chutes, haytracks, and most important of all, the water system. The water system passes through the earth for a considerable distance, collecting negative charges and carrying them into the barn and house. If the water system is not grounded to the lightning system, the negative charges may collect in sufficient quantity to attract positive charges down the lightning cable from the sky. These positive charges may arc through a building to a negatively charged water pipe, causing fire or building shattering.

Latest UL Rules

In most modern barns, the drinking cups bolted to the steel stanchions are automatically electrically inter-connected to the water system. The latest rules which govern the installation of master-labelled lightning systems, as prepared by the Underwriters' Laboratories of Chicago, definitely state that inter-connection between the water line leading into the building and the lightning protection system is a "must." Hence, there would be no need to interconnect stanchions and lightning protection systems. If, however, the stanchions are not inter-connected with the water line, the opinion prevails that they should be grounded by interconnecting the stanchions to the lightning protection system and should not be independently grounded.

Certain metal building materials require special equipment and techniques for inter-connecting to lightning grounding systems. If you plan to do the work yourself, secure the advice of an experienced reputable lightning protection man. □ □

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WATER SYSTEMS

low cost • easy to install

Here's the water system that gives you more water in more places—with greater pressure. It's the big, dependable Rapidayton Twin* Champion (shown at right). With its two impellers it actually loafs along while pumping full capacity at 40 lbs. pressure—better than city water service! Converts for shallow or deep wells; depths to 150 ft. Assembled, ready for easy installation. See Rapidayton low-cost pumps at your dealer's. Write for booklet, "What Kind of Water Pump Do You Need?"

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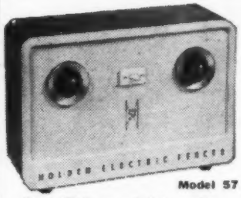
IT PAYS TO.....

FARM BETTER ELECTRICALLY



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Here it is...the first tool designed a

NEW THOR

Look what a farmer can do with just one tool

Drilling in metal for stanchion installation in a barn is one of hundreds of drilling jobs around the farm that can be done easily using the Thor FarmTool. Drills up to ¾" in metal.

Power screwdriving with the Thor FarmTool reduces "down" time of farm equipment under repair. Equipment can be repaired right on the farm. Tapping attachment is also offered.

Wire brushing shovels on plowshare can be done in just a few minutes. Other equipment can be wire brushed prior to re-painting. Accessories offered for polishing and sanding.

Lugs on tractor wheels can be removed and replaced quickly with no effort. FarmTool will work with equal ease changing wheels on the family car. FarmTool reverses with flip of switch.

Wood boring in joists prior to installation of plumbing or electrical work is fast with the FarmTool and a 2 inch auger—the tool is easy to handle in any position, no kickback.

Removing rusty and "frozen" fasteners from farm equipment is another job where the FarmTool can save time and effort. Thor FarmTool operates on standard AC or DC current.

The new Thor FarmTool is the first portable electric power tool ever designed specifically for use by farmers on jobs around the farm—it is an all-purpose utility tool with unbelieveable versatility. For an investment of $99.50—actually a $107.25 value—you are getting seven tools in one compact, powerful package—a drill, impact wrench, screwdriver, polisher-sander, tapper, hole saw and wire brush machine. Write Thor Farm & Ranch division, Marengo, Ill., or ask your farm equipment dealer for a demonstration. Thor Power Tool Co., Prudential Plaza, Chicago 1, Illinois.

THOR POWER TOOL COMPANY, CHICAGO

Branches in all principal cities

ed and built exclusively for farm use

R FARMTOOL

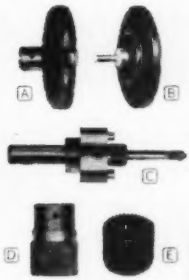
Look what's included!

The $99.50 price includes the FarmTool with 10 feet of 3-conductor cable and durable steel carrying case.

Seven sockets of varying sizes—these sockets will fit most of the fasteners found on farm equipment.

3-jaw geared chuck holds drills, reamers, taps, etc. to ½" capacity.

Use these accessories with your FarmTool



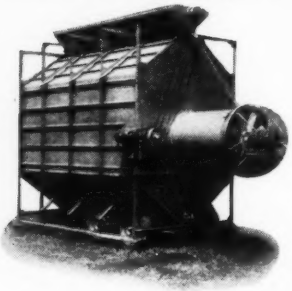
Complete flexibility for the Farm Tool is assured with this group of low-cost accessories. [A] Wire brush arbor and wire brush attachment. [B] 5" Sanding attachment. [C] Hole saw arbor. [D] Quick change chuck adaptor for screwdriver bits. [E] High Speed hole saw, from ¾" to 1½".

Thor Farm Research Center established to promote better farm living

To bring the new FarmTool to the farmer, Thor established a Farm & Ranch division and the Thor Research Center for Better Farm Living located on an operating farm in McHenry County, Illinois. This Center along with Thor engineers, farm leaders and farmers developed the Thor FarmTool. Millions of people through newspapers, magazines, network TV and radio heard the dedication and program of the Thor Center. All of this effort was designed to make better farm tools for you.

Thor FarmTools

you can solve ANY crop curing problem with Hartzell drying equipment



And you can count on your Hartzell representative to recommend the equipment which is exactly right for *your* drying needs, because Hartzell makes all types . . . fans for natural air drying and gas and oil fired units for heated air drying . . . portable units or stationary bins. For more information, just write and tell us your drying problem.

HARTZELL *propeller fan co.*
Div. of Castle Hills Corp.
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INEXPENSIVE V-TYPE MILKING PARLOR coupled with a simple cow-to-can type milking unit enables this lady to handle 15 cows plus her regular housework. Milker fits directly onto 40-quart milk can.

Small Herd Dairymen Can Make Money Too!

"It's wonderful!" exclaimed Mrs. Swindoll. "It's the only way we could possibly continue in the milk business."

So said Mrs. Charles Swindoll of Sweatman, Mississippi as she discussed their new elevated stall V-type milking parlor and the cow-to-can milker they are using in conjunction with it. The cow-to-can milker is a simple, inexpensive unit designed specifically for the small herd operator.

Swindolls formerly operated a diversified dairy and cotton farm but their cotton allotment was cut down to 9 acres. Mr. Swindoll was forced to accept employment in industry at Grenada, 20 miles away. This meant that he would no longer have time to take care of 15 dairy cows.

As a solution, they decided to mechanize the operation so that Mrs. Swindoll could do more of the chores. Now she says, "I do most of the milking and I actually enjoy it. It's much easier than much of my housework."

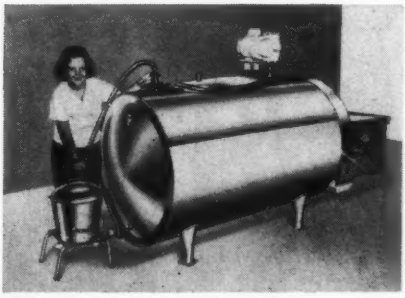
One of the nicest features about the new setup is that one person can easily handle the entire operation. As one cow is being milked, the second is being prepared. The operator stands in one spot to milk the entire herd. "And it takes just an hour to feed and milk our 15 cows," she added.

C. Y. Butts

VACUUM

Using Nature's Own Way

ZERO
Farm Milk Tanks



"Like Sucking Milk through a Straw . . . !"

How would you like to milk? . . . by pour in, by direct cow to tank hook up or with the Super Strainer as shown above? Vacuum is the quickest, simplest, most gentle method to take milk from cow to tank cold. Zero's vacuum refrigeration system cools rapidly, removing animal heat and odors. 3A approved.

Today Zero's revolutionary Spatter Spray system, just announced, is attracting nationwide publicity. Exhaustive field tests of the new system demonstrate how easily and effectively it cleans Zero tanks . . . a turn of the knob does the job for you. It features a variable speed motor instead of the conventional constant speed motor and gear box.

Although the new Spatter Spray model is now in limited production, present Zero tanks, having the necessary round shape and vacuum system, may easily be converted at any time. Write today for complete information.

ZERO Sales Corporation
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EVERSTOPTOTHINK? — an ANGLER is a sportsman who SAVES many a fish from a WATERY grave. . . . . SODDEN THOUGHT: a TRAMP is a fellow who is usually down and out but is SELDOM washed up. . . . . As the world goes today the American taxpayer is rapidly becoming his brother's KEEPER-UPPER. . . . . UPPY-CHUCK DEPT.: Where there's smoke—there's a bride cooking. . . . . FLIP-QUIP: Many a man who THINKS he has a girl on the string finds out he is on the hook. . . . . OVERHEARD: "My car is like seven into twenty." "How so?" "It won't go." . . . . Teacher: "Johnny, will you please point out a difference between mammals and insects. "Johnny: "Well, when a FLEA goes to the dogs he is happy about it." . . . It has been reliably reported that Eli Whitney's last words were, "KEEP your COTTONPICKIN' hands off my gin." . . . Zelda Malone writes: "Marriage is nothing more than a gal tying her beau in a knot." . . . . Friend of ours, VERY much henpecked, recently became a father, complained because his first child was a girl. Said he, "I was hoping for a boy, to help me with the dishes." . . . . OVERHEARD ON A BUS (one gal to another): "Here's something I MUST tell you before I find out it's NOT true." . . . SHEAR LEADER: the head student in a barber college. . . . PRINTER-LEFT-TOWN DEPT.: Society Wedding Item—"The bride was gowned in white lace and the bridesmaid's gowns were punk." . . . From THE FOOLISH DICTIONARY (1906): "Time and tide wait for NO man—but time ALWAYS stands still for a woman of THIRTY." . . . . Suitor (to girl's father): "May I count on your supporting me?" Father: "Are you running for office or do you want to marry my daughter?" . . . . A FEW PARTING THOUGHTS: A SAILOR is a fellow who, when he talks SHOP, talks SHIP. RELAXATION is LOUNGITUDE and LASSITUDE. And, an IDEAL HUSBAND is one who thinks his wife's rheumatism is as important as his OWN headache. . . . .

Your pun-peddler—DUFFY

Light Facts

Be sure to get all the light you are paying for. Dust and fly-specked electric lamp bulbs or tubes cannot put out all the light you are paying for. Cleaning them with a damp cloth increases efficiency. As a safety measure, turn off switches before cleaning.

The use of reflectors or an aluminum or white enamel painted surface above the lamps greatly increases the efficiency of lights.

Tests show that workers from age 45 to 64 need almost twice as much light to see as well as workers in the group from age 17 to 24. The younger group needed 30 footcandles to attain a visibility level of 5. The older group required 58 footcandles for the same visibility level of 5.

The average home has only 15 bulbs or tubes. The light conditioned home has about 70. How does your home rate?

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FOOT VALVES

EIGHT SIZES
Many pump manufacturers use Strataflo as original equipment.

CAN'T STICK
CAN'T LEAK

STRATAFLO Foot and Check Valves end leakage troubles, save wear and tear on pump and save their cost in service calls. They are ideal for jet-type pumps.

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Fort Wayne, Indiana

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"Everything" say thousands of Patz Barn Cleaner Users.

"It's a *specially-designed* patented Barn Cleaner Link without pins to rust, bend, bind or stretch. It's a deep forged and hammer-formed link with steel *and* strength *concentrated* in rounded, full bearing one-piece 'eye' and 'hook'." *Rounded* Corners throughout provide complete *flexibility* for 90 degree *right* or *left* hand turns or 45 degree *elevations* . . . *without jamming or binding.* No other Barn Cleaner Chain *possesses equal strength and flexibility!*

GET THE PATZ BARN CLEANER FACTS . . . FIRST. You'll be surprised today . . . *grateful* for years to come.

The Patz Link weighs over 2 lbs.; measures 2¾" x 7½" and is protected by patent number 2,712,760.

PATZ CO., Pound, Wis.
Please send complete information on Patz
☐ Barn Cleaner ☐ Self Propelled Silo Unloader
Name_____
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*Do not underestimate this necessity.

the PATZ Co. POUND, WIS.

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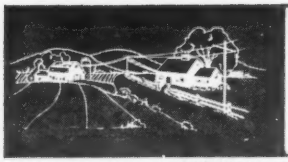


Electricity in

THE FARM HOME

EDITED By ELINOR CASAVECCHIA

AN ELECTRIC DISHWASHER is one of the wisest investments the Elmer Happel family ever made. Carol takes charge of breakfast clean-up while mother prepares sandwiches with the homemade bread she has time to make.

Profits in the Form of "Time"

For the family that invests in electrical equipment on the farm and in the farm home

By MILDRED A. LESSENICH

If only your great-grandfather could see his home now," Mrs. Elmer Happel said to her husband one day not long ago. "It wasn't much like this when he owned it," replied Elmer, as he and his three daughters surveyed the 120-acres that have been in the Happel family 107 years.

The beautiful setting for the farm buildings near Slinger, Wisconsin, is about the only thing that great-grandpa would recognize. The rolling hills and bluffs are still there but even they have changed. Apple orchards have been added. Soil conservation methods have been practiced. A herd of 38 Holstein milking cows graze in the pastures.

And the home! How it has changed. Some of the same four walls remain but rooms have been added and partitions have been removed. A basement was dug for the central heating system and laundry equipment. These are changes that great-grandpa Happel could understand, perhaps. But what's that white thing in the kitchen? "It's an electric dishwasher, great-grandpa. You put the dirty dishes in it, close the door, push a button and they come out clean."

Not even in his wildest dreams could great-grandpa ever have imagined such a thing. Nor could he understand why his great-grandson with a healthy wife and three daughters would want such a contraption.

But the Elmer Happels are different. They live in 1957 not 1857. When the Happels remodeled their kitchen nine years ago, one of the things they wanted most was an electric dishwasher. They bought the dishwasher sink, installed it under the window, built counters and

cabinets around it, put the refrigerator at one end, installed a light behind a valance over the sink, and added some convenience outlets along the counters. The electric range came three years later. That's all it took to make a really modern electric kitchen in one end of the spacious room. The rest of the room has a dining area, a place for serving, an easy chair, and a bulletin board where the family tacks things of interest or reminders for all to see.

Returns on an Investment

The dishwasher has proven to be one of the wisest investments that the Happel family has ever made. It, along with their other automatic equipment, has given them TIME. Time for Elmer and his three girls to do all of the farming on their 120 acres without additional help. Time to milk at least 24 cows 12 months of the year and to produce 200,000 pounds of Grade A milk annually. Even Carol, the ten-year-old, adjusts the inflations on the milkers and helps to feed the cows.

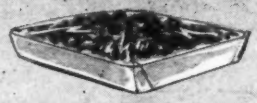
Then there's time to raise really good apples. Even time to work with the agriculture teacher at Slinger and to show his class the tricks of spraying an orchard.

Mrs. Happel and the girls have time to freeze and preserve the fresh foods from the garden and fruits from the orchard. The dishwasher sterilizes the containers so well that Mrs. Happel puts the prepared foods right into them without further processing.

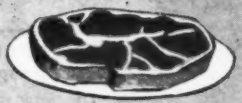
There's also time for Mrs. Happel to sew for the three girls. Blouses and skirts, Sunday dresses and an occasional party dress.

And after a busy day's work, there's time left for church, school and community affairs. Even time for the entire family to watch television. Is it any wonder they sign their Christmas greeting cards "The Happy Happels"? □ □

Which meat makes the best HAMBURGER?



PACKAGED GROUND



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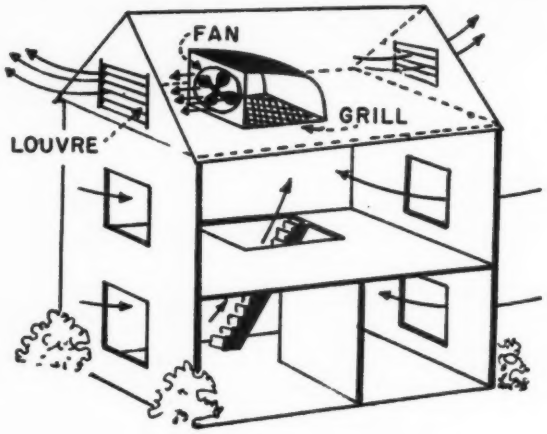

COOL NIGHTS AHEAD for the family that installs an attic fan. Properly mounted, in a plenum chamber over the correct size grill, the attic fan will draw fresh, cool air in. Hot, stale air is exhausted through the louvres.

How to Select and Install an Attic Fan

Moving air brings relief from summer's heat

Most of us take great pains to fully insulate our homes for the most economical operation of our heating systems. We completely seal our houses so that none of the precious heat will escape.

But what happens in the summer? The hot sun beats on the roof all day long. The house acts like an insulated oven and stores up the heat. When the cool relief of evening comes many of us must take to the outdoors (unless the gnats and mosquitoes are too bad), hoping for that little stir of air. Unless there's a pretty brisk wind blowing, very little of the cool night air will ever reach the inside of the house to chase out the day's heat.

The picture is far from hopeless, though, for we have as many methods, readily available, for cooling the home as we do for heating it.

One of the obvious methods is to install an air conditioner that will either recirculate and cool the air in the house, or draw fresh, cool air in. Another method, if for some reason air conditioning cannot be installed, is to install an attic fan. An attic fan will draw the cooler night air in and exhaust the hot, stale air.

If you are thinking about installing an attic fan there are several things to consider. The first is the size of the fan.

TO DETERMINE THE SIZE OF THE FAN you need to know the total cubic footage of air space in the house, and the number of air changes a minute recommended for your section of the country. It is generally accepted that homes in the southern states need a complete change of air every minute, the central states once every two minutes, and the northern states once every three minutes. These two figures (cubic feet of air space in the house and recommended changes per minute) will give you the C.F.M. (cubic feet per minute) rating of the fan you should install.

MOTOR SELECTION should be based upon the fan size and type of mounting to be used. The manufacturer can supply the horsepower requirements for his various sized fans. Generally 22 to 30 inch fans require ⅛ hp as minimum; 36 inch need ¼ hp; 42 inch need ⅓ hp; and 48 inch need ½ hp. These requirements vary slightly with fan blade pitch. If the motor is to be mounted vertically, a ball bearing type is needed. Either sleeve bearing or ball bearing motors can be used for horizontal mounting. A continuous duty motor is desirable for attic fan installations.

INSTALLATION OF AN ATTIC FAN does not have to be expensive if you utilize the natural features of the house. The fan may be installed in either a vertical or horizontal position, depending upon headroom in the attic. Providing they are large enough, an open stairway or hatchway to the attic can be utilized as a ceiling grill, and an

Fan Exhaust Opening Sizes According to Protective Covering
(Openings are in square feet)

Fan Size	*22"*	*24"*	*30"*	*36"*	*42"*	*48"*
Full Opening no screen or cloth	5.5	6	9	12	18	23
Full Opening with ½" hardware cloth	6.6	7.2	10.8	15.6	21	27
Full Opening with ¼" hardware cloth	7.7	8.4	12.6	16.8	25.2	32.2
Full Opening with 16 mesh flyscreen	11	12	18	26	36	46
Wood Louvres no screen or cloth	8	9	13.5	19.5	27	34
Wood Louvres with ½" hardware cloth	9.6	10.8	16.2	23.4	32	41
Wood Louvres with ¼" hardware cloth	11.2	12.6	18.9	27.3	37.8	47.6
Wood Louvres with 16 mesh flyscreen	16	18	27	39	54	69
Metal Louvres no screen or cloth	7.2	7.8	11.7	16.9	23	30
Metal Louvres with ½" hardware cloth	8.6	9.4	14	20.3	28	36
Metal Louvres with ¼" hardware cloth	10	10.9	16.4	23.7	32.2	42
Metal Louvres with 16 mesh flyscreen	14	16	24	33	47	60

existing attic window or ventilating louvre as an air outlet for exhausting the stale air.

CEILING GRILLS SHOULD BE LARGE ENOUGH to allow the air to pass through quietly and at a moderate velocity. Ceiling openings are usually about an inch larger than the diameter of the fan. An automatic ceiling shutter is used to seal the attic when the fan is not in use. The shutter should have a fusible link to close in case of fire.

ADEQUATE EXHAUST OPENINGS from the attic are important for satisfactory operation of an attic fan. The openings should be on the side of the house away from the prevailing winds. The size of these openings is very important. Usually it is one and a half times that of the opening in which the fan revolves. If screening is used to keep out insects, birds and leaves, the outlet area should be increased. The accompanying chart gives the recommended sizes for fan exhausts according to the type of protective covering used.

WIRING FOR AN ATTIC FAN should be the same as with any heavy duty electric motor. A separate circuit of No. 12 or heavier gauge wire should be used. Fan motors may be either 115 V. or 230 V. The switch should be placed in a convenient location. If desired, a time control switch can be utilized to automatically turn the fan on and off at preset hours. Or a thermostat may be used to turn the fan on whenever the temperatures go above the thermostat setting and to turn it off when sufficient cooling has been accomplished.

There is very little maintenance involved with an attic fan. A periodic oiling and checkup is all that is needed. Attic fans provide many years of dependable service, pulling in the cool air and sending out the hot. Summer nights in the home with an attic fan are not still and breathless, for air, on the move, brings comfort. □ □

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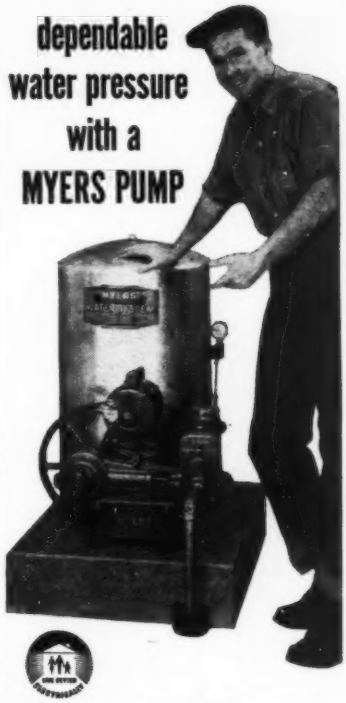

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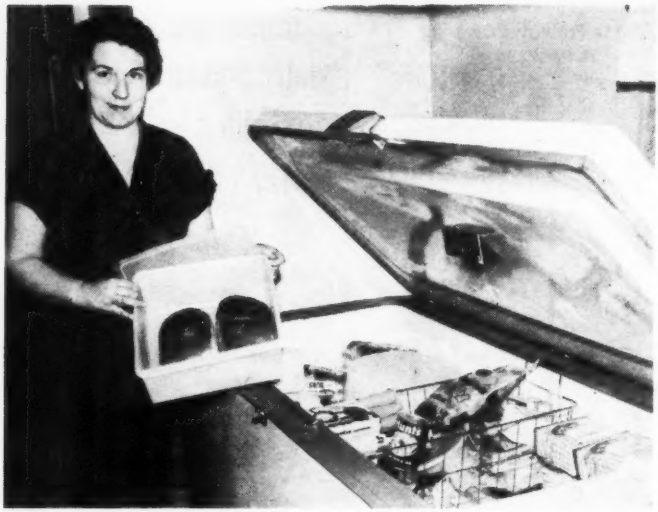

HOMEMADE BREAD AND PASTRIES are a specialty of the house at the Kruger farm. Elaine Kruger, shown here, also keeps a good supply of home-grown meats and vegetables in her 20 cubic foot food freezer.

Every Day Is Freezing Day

Good freezer management means more than convenience—it means real savings in time and labor

By **MERRILL L. BLASKEY**

Every day is freezing day" in the kitchen of the Alvin Kruger farm home. Their freezer was purchased five years ago, and has proven to be a great help to Elaine Kruger in her job of keeping her husband and four young children well fed.

Shortly after Alvin and Elaine Kruger were married, they purchased their 100-acre farm near Stillwater, Minnesota. The house was not as modern as they liked, but they decided to remodel when they could rather than build a new one. A year ago the remodeling was completed with the emphasis on the kitchen. The result is a spacious kitchen, measuring 15 ft. by 15 ft. There is room for the electric range, refrigerator, automatic washer and dryer, plus a 20 cubic foot freezer. An extra feature of the kitchen is the large window facing the highway so that Elaine can watch "the world go by" as she does her daily chores.

The Krugers have principally a beef cattle operation, plus a crop of Christmas trees to harvest from their 30-acres of woodland. A beef a year is reserved for Elaine's freezer to provide a variety of cuts throughout the year. In addition to the beef, 100 chickens are raised to be used on the farm, and are always handy in the food freezer.

Sweet corn is the main vegetable which is grown on the farm to be frozen. Peas and beans also supplement the menu and are always available from the freezer.

To Elaine Kruger, the greatest feature of a food freezer is the convenience for meal preparation. She saves time and labor by making double recipes of almost everything she cooks or bakes, and stores half in the freezer. Pastries, breads, and barbecued hamburgers are high on the list of favorites, especially with the children. As Elaine puts it, the freezer is the only safe place for storing cookies with four children around the house. A special treat for the kids, always tucked away in the freezer, are homemade popsicles.

Some freezing tricks she uses are the storing of potato chips to make sure they are always fresh, nuts for cooking, and fruit cocktail in the can. Frozen fruit cocktail is a mighty quick salad when company drops in unexpectedly.

The time and energy her freezer saves her gives Elaine more of an opportunity to take an active part in outside activities. This year she was chairwoman of the Washington County Homemakers' Achievement Day held in April. It was no surprise that her own group sponsored a freezing display.

It's almost a sure bet that the Krugers' two daughters will follow mother's footsteps in using a food freezer. Freezer projects and demonstrations will be old stuff when they reach the age for 4-H Club work.

As Elaine Kruger says, "Almost anyone could come in and cook a complete meal right out of the freezer at anytime." She said that if they ever build a new home, the kitchen is sure to have a space reserved for a home freezer, for with her, "Every Day is Freezing Day." □ □

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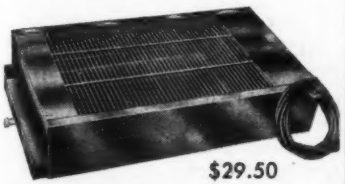

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"Pressey" Totes the Water

By NINEVAH J. WILLIS
Laurel Fork, Virginia

I hope you will pardon me but I just can't help raving about my new hired girl, "Pressey." I live on a small mountain farm where all work is hard, but I now have lots of leisure time since "Pressey" came to live with us.

The farm spring lies across the winding road cooling its wriggling little toes under the shade of a grove of stately white oak trees while babbling itself to sleep. But, if our house were on fire the water bucket would have burned first because it was already empty. These days "Pressey" takes care of that by keeping plenty of fresh, cool water always on hand. She keeps piping hot water at my every command, too.

Pressey totes the water to the chickens and to the barn. She has the water all ready and even sprays it on for me the precise moment I choose to wash the family car.

The water for that weekly wash of dirty farm clothes is always prepared. No need to hustle the children up early for that back-breaking job, or trying to catch a barrel of rain water on a dry summer day.

She anticipates my every mood. Whatever task I decide upon, she is there with that universal solvent that takes the drudgery out of farm work, hot and cold water.

All she asks in return for this ever present helping hand is a little loving care and a few pennies worth of electricity. She is always neat, tidy, economical and dependable. Now that we have known her, life would indeed be dreary without her.

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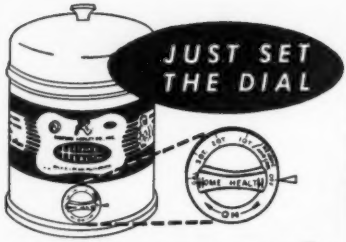

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FRENCH FRIED sweet potatoes are a favorite food at the David Rizzotte farm home. Little David won't have to wait long for his treat. Mother's fryer-cooker browns the sweets in just a few minutes.

Food tastes better automatically when

Cooking With a Deep Fat Fryer

By **FRANCES AXELRATH**

When you're packing sweet potatoes, apples, peaches or blueberries a good part of the year as I am, you need help in the kitchen and I have it. It's my deep fat fryer and cooker." That's the opinion of Mrs. David Rizzotte of Hammonton, New Jersey, a farmer's wife and a busy one. With a husband and two small boys to feed, and a house to clean in addition to helping on the farm, Mrs. Rizzotte has to rely a great deal upon her many electrical servants.

"I bought my deep fat fryer five years ago", Mrs. Rizzotte said as she sat at the kitchen table paring sweet potatoes, "and I think I've used it every day since. In fact, I find it so useful that I bought one for my mother for Christmas. You see these sweets?" She pointed to the ones on the table. "After I cut them into strips, they'll brown in my fryer in five or six minutes. And of course, it isn't speed alone that appeals to me. My husband Dave enjoys the flavor of the food so.

Fryer Is Easy To Use

Mrs. Rizzotte explained that frying foods in a deep fryer with controlled heat makes them crisp on the outside, moist on the inside, and prevents them from getting oil-logged.

She walked over to her electric fryer-cooker and picked out the wire basket. "See", she said, "what a simple appliance it is—a pot and a basket, and so easy to clean. After you take the shortening out, it looks as if nothing was cooked in it. There's no stickiness and never any burning because of the controlled temperature in the fryer-cooker."

Shortening Used Many Times

Although three to five pounds of shortening are used in the cooker, Mrs. Rizzotte says this is

In the August-September

ELECTRICITY ON THE FARM *Magazine*

LOOK FOR PRACTICAL ARTICLES ON

Corn Drying

Electricity and forced air—a combination that fills the bill in drying shelled corn

Cooling Grain

This helpful report from a University of Illinois engineer tells how a miniature fan stops grain spoilage

Mechanized Feed Handling Center

How an automatic feed grinder, used in conjunction with the proper portable bins and conveyors, makes a push-button feed processing center for small or large operations

Shop Tool Series

A new regular feature beginning in the August-September issue, dealing with a different shop tool each month

Silo Unloader

A practical report on a farm using a mechanized forage feeding center with a silo unloader and feeder

Freezer I. Q.?

A series of questions and answers concerned with freezers and freezing

Laundry Equipment

Report from Michigan State University on how to select tumbler, agitator and pulsator type automatic washers

economical since it is used over and over again—10 to 12 times. She keeps two cans for shortening, one for frying fish and the other for meats and vegetables. As long as the oil is light tan, it is usable many times.

Speaking of the ways she used her fryer, Mrs. Rizzotte laughed. "Don't get me started", she said. "I'll write a book". Before a dance for example, she entertained a few friends and made some appetizers. Mrs. Rizzotte cut egg plant into little cubes, fried them and served them hot on tooth picks. The same was done with little crabmeat balls.

"One of our steady menu items around here," she said, "is fried chicken, grown right on our farm. I do it simply. Cut the chicken into parts. Pour some flour into a paper bag, season it and then shake the chicken in the bag until it's coated. It is then fried for about 10 minutes."

But it was on sweet potatoes and their use that Mrs. Rizzotte waxed enthusiastic. Although farm women like her have been French frying sweets and sweet potato chips for years, the commercial use is just getting started. Some day you may be able to buy them frozen or in cellophane bags, but right now here's Mrs. Rizzotte's recipe.

French Fried Sweet Potatoes

For four servings pare four medium sized sweets and slice into strips ¼ to ⅜ inch around. Crisp the strips in cold, salted water for a minute or two. Drain and fry in the basket, about half full, at 375° F. until golden brown. (Three minutes for thin strips; five or six minutes for thicker pieces.) Remove with a slotted spoon and drain on paper towel. Serve hot as they are or sprinkle with salt or sugar.

The fryer-cooker is a many-purpose electric houseware, Mrs. Rizzotte points out. It can be used for many foods besides those fried in deep fat. It is a roaster, a baker, a cooker, warmer or server. □ □

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Constructive Training Programs Serve Today's Farm Youth

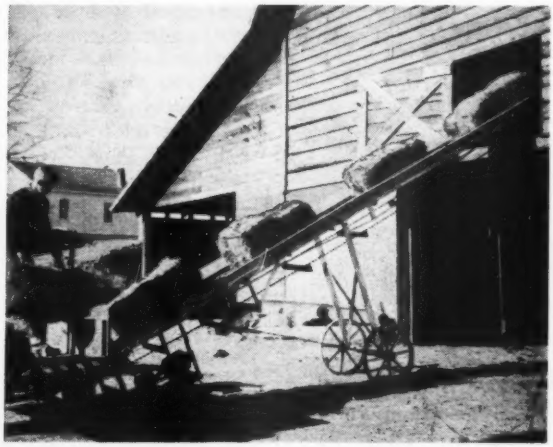
Vo-Ag classes given practical projects

By WALTER L. BAKER, JR.

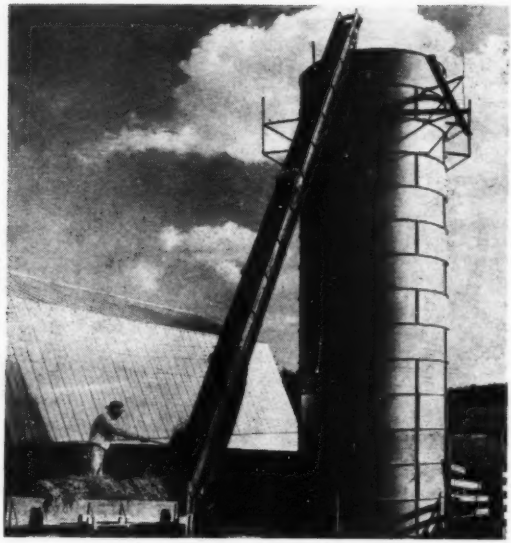
Fathers are always proud of accomplishments their sons make. James D. Smith, a farmer from Jasper, Alabama, is no exception to this rule. He beamed with pride as he showed us the portable elevator that his son, Jimmy, had built as a part of his FFA farm mechanics training. "Jimmy saved us a good $300 by building it and it's just as sturdy as any elevator you could buy," he said. "It's already saved us far more than it cost."

Jimmy is a senior this year at Walker County High and for the past three years has had Farm Mechanics as a project in his vocational agriculture classes. As a result of his training, he has become the general repairman at his father's farm. He has built a utility trailer, a hay wagon, a heavy welded gate for the pasture and a number of other useful items.

With that background, he offered to take on the task of building a portable elevator for his father. Smith always puts



JIMMY SMITH LOADS baled hay onto the elevator which he built in his farm mechanics class at high school.



PORTABLE ELEVATOR powered by a 1 hp motor does the silo-filling job on the farm of I. S. Smith, Alexandria, Ala. This beef cattle producer also built this unit in his farm workshop.

up from 7,500 to 10,000 bales of hay each year. Labor was growing expensive, as well as scarce, and he faced a real problem in finding some way to continue doing it. His rural service engineer had convinced him that a portable farm elevator offered at least a partial solution to his problem and had agreed to help Jimmy with its construction. Grady Hendrix, Jimmy's vocational agriculture teacher, was most interested in the project also. The three of them shortly developed a plan.

Everything that went into the elevator was bought locally. Iron was used wherever possible. Carrier blades were of angle iron. Plenty of 1½-inch angle iron was used as braces. Where it was impossible to give sufficient strength through welding, parts were bolted together. An old windlass was purchased and fitted to the elevator to raise it and lower it as necessary. A 1 hp motor was used to power the unit. The entire device was mounted on 24-inch wheels.

Last fall the Smiths used it to put baled hay into their barn loft. It handled bales at the rate of 500 per hour.

This project is just another proof of the far-reaching benefits of the many training programs our young farmers of today are privileged to have. They are eager to learn. When given a little guidance and encouragement, the vastness of the results can be surprising as well as very gratifying to the tireless youth leaders who give of their time and energy to make them better farmers of tomorrow. □ □

The new dual-purpose Dempster Convert-o-jetmaster water system allows you to change from shallow-well to deep well (down 90 ft.) operation at little cost—*regardless of most water conditions.* Long-life, stuffing box filters out abrasive particles. Removable bronze sleeve stops wear on motor shaft for added years of trouble-free service. Choice of powerful ½ H. P or thrifty ⅓ H. P. motor. Delivers up to 835 gals. per hour.

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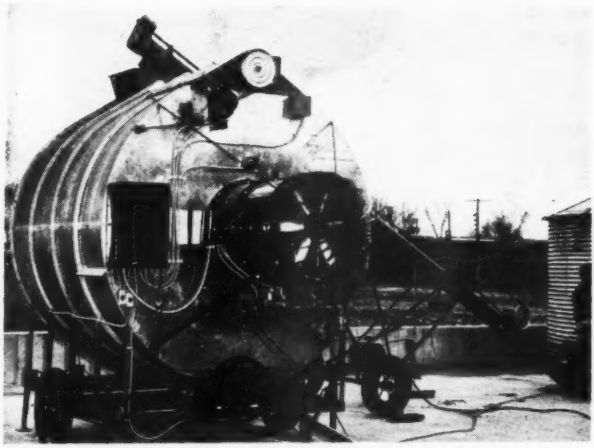

PUSH ONE BUTTON and this new drier fills itself, starts the fan, adds heat as needed, rifills drying chamber to compensate for shrinkage, cools the grain, and then unloads itself.

Completely Automatic Crop Drier

New portable batch unit introduced

The last ten or fifteen years have seen vast changes and improvements in crop drying equipment and practices. Research is going on every year to add to our knowledge of know-how regarding the complicated processes involved in removing unwanted moisture from kernels of grain or stems of hay.

Crop drier manufacturers have kept pace with this research by developing new units, perfecting present models, simplifying operation, increasing capacities and efficiencies and reducing costs in both mechanical operating expenses and labor. We want to take our hats off to both the re-research workers and the manufacturer's design and development engineers who have made such outstanding contributions to this segment of today's scientific farming.

A notable example of this progress is a new and completely automatic portable batch drier which has just been introduced by one of our leading manufacturers. It incorporates all the latest devices of automation and safety control. Actually, one button controls the entire operation. Pressing this switch sets into motion a series of operations that fills the batch drier, starts the fan, adds heat as needed, refills the drying chamber to compensate for shrinkage, cools the dried grain, and unloads the drier. Then the cycle is repeated as long as wet grain is available and there is room to empty the dried grain. The unit will handle small grains, shelled corn, sorghums, or peanuts.

The robot-like operation of this drier is indeed fascinating. A central control panel contains the "brains" for such automation. At the beginning of a

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drying day, the operator sets controls for the particular drying conditions and grains involved. Included are settings for maximum drying temperatures, time interval for heat cycle application, and desired cooling temperature. Also found here are the controls which start and stop the conveyors or elevators that fill in wet grain and remove dried grain. A special sensing switch in the wet grain supply conveyor will stop the entire operation when wet grain is exhausted. A similar switch in the dried grain discharge conveyor will stop the operation, should this bin or truck box become filled.

Fan is Removable

The new batch drier is available in four sizes. All can be operated by single phase motors of 7½ hp or less. The 144 bushel size uses 3 or a 5 hp; the 216 bushel uses 7½; the 288 uses two 5 hp motors; and the 360 bushel unit uses two 7½ hp units. On the dual motor units, one motor and fan is mounted on each end of the drying chamber. The fan unit is so designed that, if desired, it can be removed and used separately for natural air drying of hay or for cooling grain.

The drying chamber itself is made up of two perforated drums. The outer drum is eight feet in diameter; the inner is six feet in diameter. The batch of grain is fitted into the space between these drums, giving a 12-inch layer of grain for most efficient drying. Augers are used to fill and empty the batch compartments.

The burner system that supplies heated air is very similar to a home furnace. It uses LP or natural gas. As a special safety feature the gas is used in vapor form under a pressure of only 1½ pounds per square inch.

This new crop drier provides an entire handling and processing system in itself. It is an advancement that is truly automatic—runs hour after hour unattended. Progress such as this is an excellent example of what modern mechanization can do for agriculture.

For manufacturer's name of this unit or other crop drying equipment, we invite you to use the Readers' Service coupon found on page 34. H. J. HANSEN

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OUT OF SIGHT OUT OF HEARING

AT BOTTOM OF WELL!

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Whenever you need further information about electrical equipment and appliances, you can depend upon the Manufacturers who are advertising in this magazine. We have indexed here for your convenience in alphabetical order the 36 Manufacturers whose advertising is appearing in this June-July issue.

When writing to these Manufacturers be sure to mention you saw their advertising in ELECTRICITY ON THE FARM Magazine.

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If you are unable to get information about the particular equipment you require from our advertisers as listed above, our Reader Service Department will be glad to help you. As a reader of this magazine you are entitled to this information service free of cost.

Just fill in and mail the coupon below, or use a similar form, and we will provide the names of manufacturers and when possible will have these manufacturers send you descriptive literature.

ELECTRICITY ON THE FARM 6-57

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QUESTIONS AND ANSWERS

Hay Drying

▶**Question:** *What advantages result from artificially drying hay?*
F.A.P., Indiana

▶**Answer:** There are many advantages, but important among the reasons for artificially drying hay are: The leaves are not lost in the field which means higher quality forage, field exposure time is reduced and losses due to weathering are reduced by getting the hay off the field sooner; haymaking labor peaks are reduced and labor demands are leveled off.

Cleaning Steam Iron

▶**Question:** *I've had my steam iron for 8 years now and have had no trouble. But, I did hear that they should be cleaned every so often. I'd be glad to have some information on this.*
W.E.N., Oregon

▶**Answer:** If you have been using soft or distilled water in your steam iron there should be no need to clean the inside. However, if hard water is being used there is a possibility that a lime deposit has formed on the sides of the cavity and in the steam vents. If this is the case, it is suggested that the reservoir be filled occasionally with distilled vinegar, allowed to steam for 15 minutes, and then left to stand overnight. In the morning the vinegar should be poured out and the cavity thoroughly rinsed.

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Compared to shoveling, handling small grains *electrically*, is child's play!

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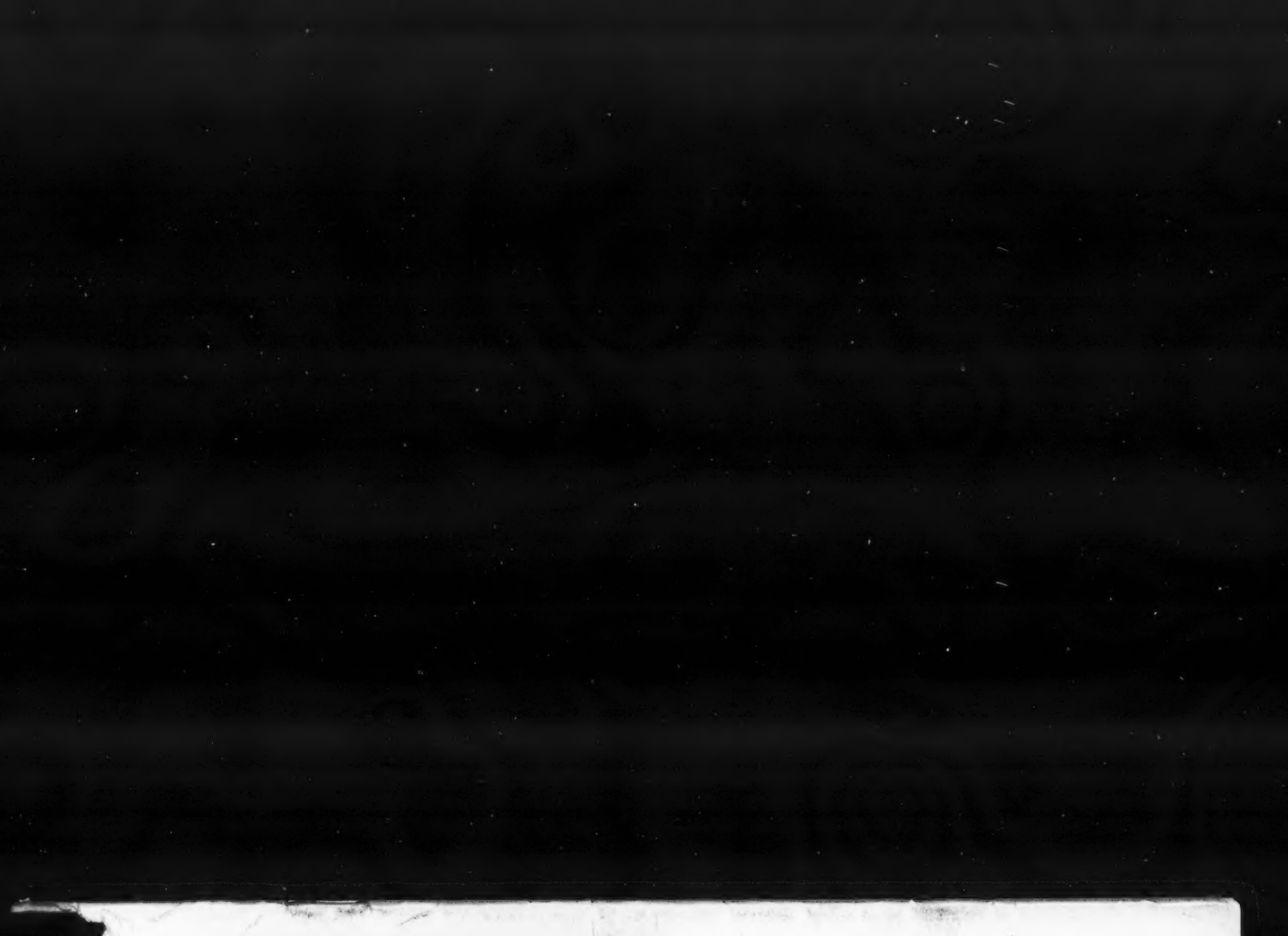
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